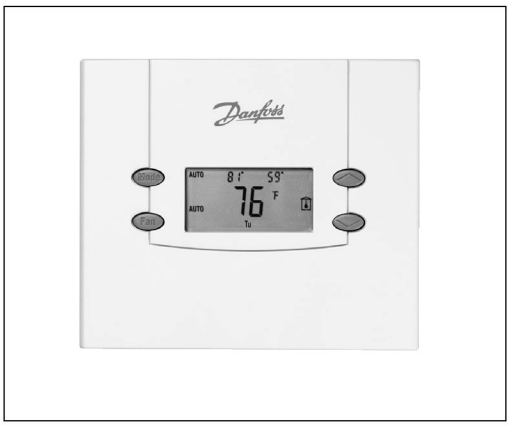
Data Sheet

8000 Series Programmable Thermostats for Heat/Cool & Heat Pump Applications



Features

The 8000 Series of programmable room thermostats provide control of multi-stage heating and cooling systems including heat pump systems. In addition to the normal thermostat functions, 8000 series models incorporate a wide range of advanced features which are selected and programmed by the installer at the time of installation.

All models offer 7 day, 5/2 day and 24 hour programming options, and can also be set up as non-programmable thermostats if the application requires it. All models offer 2, 4 or 6 time and temperature events each day with dual set-point adjustment allowing the heat and cool set points to be set completely independently of each other. In addition to temperature programming, fan operation and occupancy relay (on models so equipped) can also be programmed, allowing maximum flexibility when using dampers or UV lights etc.

All models incorporate two separate optimum start controllers one for heat and one for cool, which bring on the system ahead of the programmed time. The recovery time period varies as a function of load but has a maximum limit imposed on it to prevent excessive energy consumption.

The majority of the advanced features are selected and set in the advanced programming mode, and can be protected by an electronic keyboard lock that can be set to partially or totally disable the keyboard function during normal operation. This lock is in addition to the mechanical locking device for the cover supplied.

The 8000 series is available in conventional heat/cool versions (including a universal model with reversing valve connections that can be used in simple 1 heat/1 cool heat pump systems), and in full featured heat pump versions. All models can be used with either the built-in sensor incorporated in the product or with remote sensors. Up to four remote sensors can be used to provide temperature averaging, please refer to wiring information for connection details.

Summary of Features

- All models provide 7 day, 5/2 day and 24 hour programming options
- All models can be set up as non-programmable thermostats
- All models can be set up for 2, 4 or 6 event each day
- Heat / cool models available in 1 heat / 1 cool & 2 heat / 2 cool versions
- Heat pump versions available in 2 heat / 1 cool and 3 heat / 2 cool versions, all with auxiliary/emergency heat control switch
- All models provide programmable fan settings including smart fan
- Most models offer programmable occupancy relays for controlling dampers, UV lights etc
- All models offer optimum start control for heating and cooling recovery period
- All models offer a service mode which allows the installer to manually sequence the heat/cool and fan stages during system start-up. (Refer to Installer Setting Guide).

Specifications

Temperature range	Heating, 43-86°F, (6-30°C), Cooling, 61-104°F (16-40°C)
Dead zone options	2,5,7,10°F (1,2,3,4°C), selectable by installer
Programming options	All models can be set for 24hr, 5/2 or 7 day operation by installer
Programmed events per day	Non-programmable 2, 4 or 6 selectable by installer
Vacation programming option	Up to 99 days, heat & cool set points can be set independently
Factory pre-set programs	Yes, refer to user manual details
Control ouput	PI algorithm with Chrono-proportional output and adjustable cycle rate
Power supply	24 volt models 20-30 Vac 60 Hz Battery model 2 x AA alkaline batteries
Memory retention	Rechargeable on board battery for real time (48 hours when fully charged), non-volatile memory device for all other settings.
Fan mode options	Auto, On or Smart-Fan all programmable
Programmable Occupancy Relay	Yes, most models
User mode selection Heat/cool models Heat pump models	 Heat/Cool/Auto/Off and holiday and thermostat mode Heat/Cool/Auto/Off plus emergency heat, holiday and thermostat mode
Output relay voltage rating	10-24 Vac
Output relay current rating	10mA to 2A resistive
Installer DIP switch settings	Yes, refer to Installer Setting Guide
Installer advanced programming settings	Yes, refer to Installer Setting Guide
Installer service mode option	Yes, refer to Installer Setting Guide
Minimum On/Off Time Control	Yes , adjustable, all models
Reversing Valve Connections	All HP versions & HC8111-1RJ model
Heat pump balance point control, HP Models	Yes, programmable high and low balance points (outdoor sensor required)
Lockable keypad (Full/Partial)	Electronic keypad lock, plus mechanical locking catch on cover flap
Limitation of high & low set points	Both heat and cool ranges can be limited or locked
Optimum Start Control	Yes, separate settings for Heating & Cooling modes
Limitations of temperature override	Can be limited to +/- 3°F (2°C) or disabled
Temperature Override	Can be limited to “next event”, 1, 2, 3, or 4 hours, or disabled
Max ambient temperature	113°F (45°C)
Software Version	Valid for software version 3.00
Dimensions (inches)	5 1/8" x 4 7/16" x 1 1/16"
Maximum remote cable sensor length	160 feet (50 meters)

Advanced Programming Options

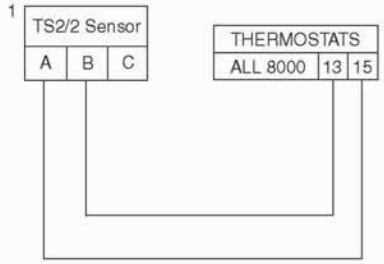
Option	Description	Default Setting	Optional Setting	Comments
1	Temperature override timer	NE (next timed event will reset the override)	1, 2, 3 or 4Hr, or DIS	1, 2, 3 or 4 hours override, or override disabled
2	Fan run-on timer after each cooling cycle	OFF	30, 60 or 90 seconds	Fan runs on for additional 30, 60 or 90 seconds after each cooling cycle
3	Fan run-on timer after each heating cycle	OFF	30, 60 or 90 seconds	Fan runs on for additional 30, 60 or 90 seconds after each heating cycle
4	Enable or Disable occupancy relay and Smart Fan Programming	DIS (able)	En (able)	When enabled this feature sets 3 functions: 1. Occupancy relay can be set to open or close at each event time 2. The fan can be set for AUTO or ON at each event time. 3. Optimum Start Control will be effective at each event time. When this feature is disabled the Occupancy Relay and smart fan energizes at first programed event time and de-energizes at the last programed event time, and OSC will only operate at the first event time of the day.
5	Fan Lock	ALL	LOC	ALL allows AUTO, ON or SMART fan to be selected. LOC disables the fan button and locks the thermostat in SMART fan mode.
6	Use of keyboard disable (DIP switch 5)	NOR	FUL	NOR = PROG key disabled and temperature override limited to 3˚F up or down from setpoint. This feature may be used in conjunction with options 1 & 5. FUL = full keyboard lockout.
7	Minimum deadband	5˚F	2˚F, 7˚F or 10˚F	Minimum temperature difference between heating and cooling setpoints
8	Max Heating Temp	86˚F	85˚F to 43˚F	Used in conjunction with Option A
9	Min Cooling Temp	61˚F	62˚F to 104˚F	Used in conjunction with Option b
A	Min Heating Temp	43˚F	44˚F to 86˚F	Used in conjunction with Option 8
b	Max Cooling Temp	104˚F	103˚F to 61˚F	Used in conjunction with Option 9
c	Optimum start control for heating	0 (off)	1-8	Sets the maximum amount of start up time for heating. 1 = 15 mins, 2 = 30 mins up to 8 = 120mins. Refer to table on page 7
d	Optimum start control for cooling	0 (off)	1-8	See above
E	Calibration	0˚F	+ 3˚F to -3˚F	Raises or lowers display temp in 1˚F steps
F	Compressor minimum off timer	4 mins	3 mins or 2 mins	Sets the compressor min Off time for each cycle
H	Compressor minimum on timer	2 mins	0-4 mins	Sets the compressor min On time for each cycle
L	Low balance point (low temp cut off)	16˚F	-22˚F to +60˚F or Off	Below this temp the thermostat switches off the heat pump and runs with auxiliary heat alone. Only available when outdoor sensor is installed
N	High balance point	50˚F	32˚F to 70˚F or Off	Above this temp the thermostat switches off the auxiliary heat and runs with the heat pump alone. Only available when outdoor sensor is installed
r	Remote room sensor disable	En (able)	DIS (able)	Disables or enables the remote room sensor. Only available when remote sensor is installed

Ordering Details

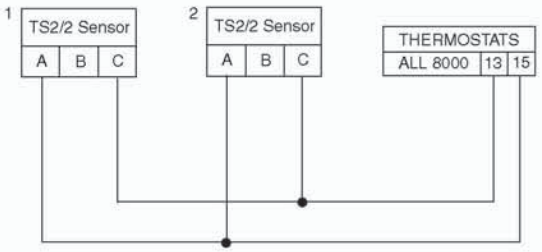
Number of Stages & Application	Model	Code Number
1 Heat 1 Cool for heat/cool systems (no occupancy relay)	HC8111-1	087N6807NA
1 Heat 1 Cool for heat/cool or heat pump systems	HC8111-1RJ	087N7224NA
2 Heat 2 Cool for heat/cool systems	HC8221-1J	087N6939NA
2 Heat 2 Cool for heat/cool systems (battery operated)	HC8220-1J	087N6940NA
2 Heat 1 Cool for heat pump systems	HP8211-1RJ	087N6959NA
3 Heat 2 Cool for heat pump systems	HP8321-1RJ	087N6963NA
Accessories		
Remote room sensor	TS2/2	087N728500
Duct mounting sensor	TS5	087N681200
Outdoor sensor	TS6	087N681300
Optional wall plate for 8000 Series thermostats	1810	087N8000WP

Sensor Averaging

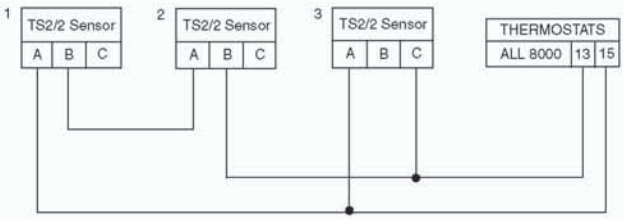
Single sensor



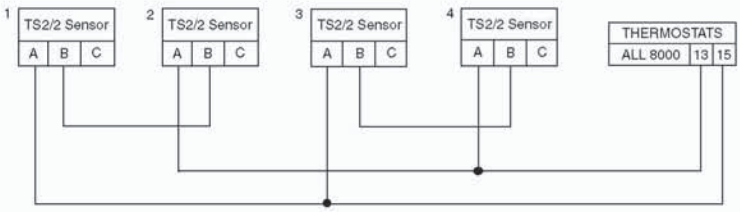
Two sensors arranged for averaging



Three sensors arranged for averaging



Four sensors arranged for averaging



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Danfoss Comfort Controls
7941 Corporate Drive
Baltimore, MD 21236 USA
Tel.: 443 512 0266 Fax: 443 512 0270
www.danfossheating.com

Danfoss Inc.
7880 Tranmere Drive
Mississauga, ON L5S 1L9 Canada
Tel.: 905 676 6000 Fax: 905 676 0279